AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for assigning an address to a node in a network having an arbitrary topology, the method comprising:

providing a first address to a first node such that the first address includes a description of a path to the first node; and

establishing a mapping between a plurality of output ports in the network and bits in the first address such that a packet, directed to the first ~~address~~ node, at a second node in the network is forwarded via an output port on the second node in the network, in response to a specified bit in the first address having a specified value.

2. (Original) The method of claim 1 wherein the network is an optical network.

3. (Original) The method of claim 1 wherein at least one node in the network has more than one address.

4. (Original) The method of claim 1 wherein concurrent bits in the first address map to output ports on the second node.

5. (Original) The method of claim 4 wherein the map is a one-to-one correspondence.

6. (Original) The method of claim 4 wherein each of the output ports on the second node maps to a bit in the concurrent bits in the first address.

7. (Previously Presented) The method of claim 1 further including associating an output port in a node to an unused bit in a sub-field corresponding to the node in an address such that in response to a new address for directing a packet to a node in the network, the packet is forwarded via the output port.

8. (Previously Presented) The method in claim 1 further including determining whether two bit positions in all the addresses of all nodes in said network are identical; determining whether the values at two bit positions in all the addresses

of all nodes in said network are complementary to each other and if so, eliminating one of the bit positions; and eliminating, in response to a determination that the two bits are identical for all nodes in the network, one of the bit positions.

9. (Currently Amended) A method of addressing a packet in [[an]] a network having a plurality of nodes, each node in the plurality of nodes having at least one address, and furthermore, the packet having a plurality of fields including an address header, the method comprising:

mapping each address into a distinct bit in the address header in the packet such that a particular address header corresponds to one and only one address;

configuring, at each node in the network, an output port such that in response to a bit in the address header in the packet having a desired value, the packet is forwarded via the output port; and

selecting the desired value for the bit in the address header such that the packet is directed to a node associated with an address corresponding to the packet header.

10. (Previously Presented) The method of claim 9 further including:

adding a new address to the network, the new address associated with a second node;

mapping the new address into an unused bit in a new address header in a new packet such that the new address header corresponds to the new address; and

configuring, at each node in the network, a second output port such that in response to the unused bit in the address header in the packet having a new desired value, the new packet is forwarded via the second output port whereby a new packet is directed to the second node.

11. (Previously Presented) A network having a plurality of nodes arranged in an arbitrary topology wherein a first node in the plurality of nodes is associated with an address, the address further representing a path to the first node in the plurality of nodes from a second node in the plurality of nodes such that a bit in the address

specifies an output port on the second node in the plurality of nodes for routing a packet directed to the first node in the plurality of nodes.

12. (Original) The network of claim 11 wherein furthermore each of the plurality of nodes has at least one address such that at least one bit in the at least one address is associated with a first output port on a second node in the plurality of nodes, the first output port of the second node directing a packet to a node corresponding to the at least one address.

13. (Original) The network of claim 12 having furthermore a third node in the plurality of nodes such that the at least one bit in the at least one address is associated with a second output port on the third node in the plurality of nodes, the second output port of the second node directing a packet to the node corresponding to the at least one address.

14. (Original) The network of claim 13 having further a routing algorithm wherein a node of said network routes a packet to the output port identified by the position of the non-zero bit in an address sub-field associated with the node in a destination address of the packet.

15. (Previously Presented) In an optical packet-switched hierarchical network having an arbitrary topology, a plurality of nodes and organized into at least two levels, each node at a higher level comprising at least one lower-level-node, and each lower-level-node comprising a plurality of output ports, each lower-level-node comprising a plurality of output ports, a method of establishing a self-routing protocol, the method comprising:

determining whether a set of paths from all other nodes of said network to a particular node can be stored in an address for the particular node;

identifying, in response to an affirmative determination, each output port at each lower-level-node of said network by a bit position in at least one of the plurality of levels of said addresses; and

generating a multi-level address for each node of said network.

16. (Original) The method of claim 15 wherein furthermore each address comprises a plurality of sub-addresses, wherein each of said sub-address is associated with one of the levels of said multi-level network, the sub-address at each level specifies the routing information among a subset of nodes at the level.

17. (Previously Presented) The method of claim 16 including furthermore shortening a self-routing address of a node in response to determining that more than two or more bits in a plurality of self-routing addresses are identical.

18. (Previously Presented) The method of claim 16 including furthermore shortening a self-routing address of a node in response to determining that two bits in a plurality of self-routing addresses are complements of each other in a plurality of self routing addresses.

19. (Previously Presented) In an optical packet-switched hierarchical network having an arbitrary topology, a plurality of nodes and organized into multiple levels, each level comprising a plurality of nodes at that level, each node at the level comprising a plurality of nodes at the next lower level, and each node at the level comprising a plurality of output ports, each node comprising a plurality of output ports, a method of routing a packet having a self-routing address, the self-routing address having a plurality of sub-fields corresponding to the multiple levels in the hierarchical network, the method comprising:

routing a packet at a node by evaluating a sub-field in the self-routing address of a destination in the packet,

determining, for the sub-field of the self-routing address of the packet whether one of the plurality of bits identifying an output port of the node in the sub-address is set; and

routing the packet, in response to the one of the plurality of bits identifying an output port of the node in the sub-address being set, to the output port.